Air-Ground Integration: Proven TTPs

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Just what is air-ground integration? And what makes it successful? The purpose of this article is to share proven tactics, techniques, and procedures (TTPs) associated with air-ground integration with maneuver and aviation forces throughout the U.S. Army. These are the TTPs practiced in the 1st Squadron, 4th U.S. Cavalry, the divisional cavalry squadron for the 1st Infantry Division. The divisional cavalry is a unique organization because it remains the only organization in our Army that possesses both ground and air elements in a single battalion-sized organization. This unique dimension allows us to refine our combined arms TTPs with relative ease on a regular basis. These TTPs can be adapted to every maneuver organization, because as the Kiowa Warrior is part of the division cavalry, there is a great chance the air cavalry could operate along with any company/team or battalion within a brigade combat team. Many of these techniques could also be used when integrating attack helicopters into a close air support role. In fact, the TTPs identified are universal to nearly every aspect of combined arms where ground and air elements operate within the context of a common mission, regardless of aircraft type or ground unit composition.

Prior to the onset of any mission, leaders must understand there are five general opportunities for air-ground integration during an operation:

- Planning
- Operation order (OPORD)
- Rehearsal
- Face-to-face
- Radio coordination

These opportunities may be completed in sequence or may stand alone as individual events, but only time available will determine the level of detail. These opportunities are also multiechelon, occurring at all unit levels from the squadron/task force down to the dismounted scout/infantry squad.

The bedrock, however, to consistent quality air-ground coordination is adhering to standing operating procedures (SOP). Every time both the air cavalry troops (ACTs) and the ground cavalry troops (GCTs) conduct coordination, they must follow this SOP. For units without organic aviation assets, inclusion of an air-ground integration annex may prove useful when aviation assets are included. See Figure 1 for an example air-ground integration checklist.

Planning: Air-ground integration begins during the planning stage. The squadron/task force commander lays the groundwork for his maneuver plan and gives guidance on his intent for air in support of that plan. The staff then develops a recon focus for air weapons teams (AWTs) during execution, getting as specific as possible without limiting the flexibility of AWTs to operate across the squadron/task force front. Logistical planning is also critical, to minimize the limitations of aircraft station time and maintenance availability. It's here that the fighter management decisions are made to ensure that aircraft are available and on station when they can best assist in the success of the maneuver plan. Air planning must be part of the maneuver plan, never parallel or separate. Thus the S3 (air) must be the quality control representative ensuring that the final OPORD products and planning leading to those products have addressed air use from top to bottom, not as an afterthought. Include air assets as you would engineers or field artillery (FA) fires in any plan. Include the air troop/company commander to assist the S3 air in planning when the situation and fighter management cycle will allow it. See Figure 2 for Kiowa Warrior planning capabilities.

The OPORD. Air-ground integration at the OPORD is ideal. At the squadron/task force OPORD, the commander and the operations officer define critical periods, locations, and task-purpose of the ACTs for the complete duration of the mission and possible sequels to the executors in the form of both ground and air troop commanders. The squadron/task force concept of operations provides a common understanding of how the unit will fight while the scheme of maneuver

Air-Ground Coordination Checklist

Briefed to the ACT/air mission commander (AMC) by the GCT commander

- Enemy situation/recent contact
- Bypassed enemy locations
- Friendly situation (front line trace of scout/tank sections, locations of troop commander, troop TOC, and mortars)
- Mission statement (squadron, troop, and platoon)
- Concept of the operations
- GCT graphic control measures
- Commander's critical information requirements (CCIR)
- Actual and templated air defense artillery (ADA) in zone/sector (friendly/enemy)
- Fire support plan (FA/mortar)
- Battle handover line and criteria
- Call signs/frequencies
- Named and targeted areas of interest (NAI/TAI)

Briefed to the GCT by the ACT/AMC

- Number of aircraft/AWTs
- Weapon configurations (area suppress/point track)
- Time on station
- Any limitations to support (weather/flight hours)
- Concept of the operation
- Maneuver/recon-focus of ACT (specified task from squadron)
- Direction in/out of sector/zone
- ACT graphic control measures (ops/ABF/SBF/LZ/PZ/Routes/A2C2 plan)
- Forward arming and refueling points (FARP)/downed aviator pick-up points (DAPP) locations and procedures
- Call sign/frequencies including

Note: If it doesn't apply, simply omit it.

Figure 1

details every action of each subordinate element.

The squadron conducts a movement to contact (MTC) with two cavalry troops forward abreast and one in reserve. ACTs will initially conduct an aggressive zone reconnaissance one phase line (PL) forward of the GCTs focusing on trafficable routes for GCT cav teams and obstacles. Emphasis is on speed to PL Walnut. As the squadron passes into the enemy security zone, the air cavalry troops operate above the GCTs to identify and engage with indirect fires enemy recon forces in zone. GCTs conduct mounted and dismounted reconnaissance to identify and destroy enemy recon forces, ADA systems, and identify CSOPs. Troops in contact conduct hasty attacks to destroy or fix the enemy while the adjacent troop develops opportunities to strike the enemy from the flank. ACTs maintain observation in-depth to identify enemy counterattacks. The reserve is prepared to attack behind the lead GCTs to destroy identified enemy forces, screen the southern flank, or occupy a hasty defense to defeat enemy counterattacks. ACTs are prepared to assist the reserve in movement and battle handover with troops in contact. Indirect fires aim to destroy enemy air defense assets and recon BMPs; obscure the enemy as troops move through danger areas, obstacles, and choke points; and to neutralize CSOPs prior to a GCT hasty attack. On order, indirect fires shift to isolating enemy forces from reserves and supporting positions in-depth and disrupting enemy counterattack. Engineer efforts focus on rapid reduction of obstacles to ensure GCTs freedom to maneuver, then shifts to countermobility to disrupt enemy reserves.

Key to effective air-ground integration is detailed reconnaissance focus for the air troops. Fighter management (FM), weather, and station time are all limiting factors that can be managed by air troop commanders if their recon focus is made clear from the start. In the example above, the AWT recon focus is clear in that they must conduct a zone recon *focused* on trafficability of routes. An even better focus would be to list specific routes in the tasks to subordinate units in order of importance to help AWTs prioritize their recon effort. The tendency to overtask AWTs will only reduce their effectiveness.

From the squadron OPORD the troop/company commanders (TCO/CCOs) know when, where, and with whom they are operating. The initial coordination between the ACT and GCT commanders cover generalities such as the troop form of maneuver, TOC locations, current dispositions, and time and place of troop OPORDs/air mission briefs. Ideally, the ACTs send a representative to the GCT's OPORDs, but fighter management and overlapping TLPs sometimes prevent this from occurring. However, if a representative is available, he or she is best utilized by briefing their troop concept of operations, time on station, number of AWTs available, call signs, frequencies, weapons mixes, and specific tasks they have been assigned by squadron during the friendly forces portion of the GCT's OPORD. Additionally, troop graphics are exchanged and disseminated to the lowest level to better foster a common understanding of the battlefield.

The Rehearsal. The squadron/task force combined arms rehearsal is used to further strengthen the concept of operations as well as to rehearse the synchronization of specific friendly actions at certain times and places on the battlefield. Adjacent unit coordination and cross talk is mandatory. It also identifies opportunities for combined air-ground operations and illustrates when ACTs and GCTs require each other's assistance, such as the S2/threat commander engaging an AWT with enemy ADA forcing the TCOs to rehearse actions on contact and a target handover of the ADA threat to the GCT, which, in turn, will destroy the threat, allowing the

Kiowa Warrior Capabilities

When planning to incorporate air cavalry aircraft in the ground maneuver plan, one must understand the capabilities and limitations of the aircraft involved. Kiowa Warriors use both the thermal imaging system (TIS) and TV subsystems of the mast mounted sight (MMS) to locate and identify targets several kilometers forward of ground scouts. They then verify target location with the laser rangefinder/designator, videotaping the contact on the 8mm video recorder, if desired for later review.

The Kiowa Warrior is one of the most lethal indirect fire platforms in the military due to its laser rangefinder and the ability to directly integrate laser grids into digital calls for fire. Thus, aeroscouts always attempt to use indirect fires first to prevent decisive engagement and compromising the recon mission.

If necessary Kiowa Warriors can employ any combination of two of the following weapon systems: .50-cal. machine gun (500 rounds), 2.75-inch rockets (seven rockets per pod), Hellfire Missiles (two per launcher), and Air-to-Air Stinger Missiles (two per launcher). The .50 cal. and rockets are area suppression systems and the Hellfire and Stinger are point weapons. Stinger missiles are only used when there is a high enemy air threat. The preferable AWT weapons mix is at least one Hellfire launcher with two missiles, and a combination of rockets and 50 cals. between the two aircraft, such as one Aircraft – Hellfire/Rocket, one Aircraft Rocket/.50 cal. In this case, the area weapons are used primarily in a self-defense role, with indirect fires being the primary means of killing the enemy. Hellfires are reserved for high pay-off targets like self-propelled ADA, armor, or C2 vehicles.

Kiowa Warriors, when fully loaded and armed have a station time of approximately 1½ hours. This depends on FARP locations, weather, and actual aircraft weight. Timing these FARP turns is critical to air-ground success. Fighter management allows a crew to fly 8 hours day, 5 hours night, and 6 hours combined day and night within a 12-hour duty day. Flight extensions of up to 1 hour are possible if authorized by the squadron commander.

Figure 2

Photos by Ralph Zwilling

ACTs to continue the mission. During the rehearsal, commanders adhere to a strict call and response sequence orchestrated by the squadron chief of staff or executive officer employing the action-reaction-counteraction of enemy activity to friendly maneuver. TCOs use radio call transmissions/procedures when coordinating/cross-talking, reporting and communicating with higher. Finalized consolidated troop graphics are also distributed to all commanders prior to departing the rehearsal.

If time permits, one of the ACT platoon leaders and his wingman attend the troop rehearsal. The troop rehearsal is similar to the squadron rehearsal but at a micro level which refines the common understanding of the battlefield for the tank commanders, Bradley commanders, and Kiowa Warrior pilots. The benefit of having the aeroscouts present at the troop rehearsal is enormous. Scout platoon leaders have already issued the OPORD and have identified where they would most need the AWT's assistance. Likewise the ACT platoon leader has done the same and they can look each other in the eye and talk the mission through in the presence of the other scout and tank vehicle commanders. It is also an opportunity to tie the ACT into the troop's fire support plan and for the ACT platoon leader to request any mortar targets to assist with their scheme of maneuver. Ground leaders should keep in mind that Kiowa Warriors are best used looking deep and using the maximum stand off of their mast mounted sight thermal capabilities. Air cavalry leaders also have a responsibility to ensure their assets are best used to accomplish the commander's intent, and when they are being underused, they must be persistent with the ground troop leaders to ensure full integration. Observation of primary mounted avenues of approach, flank security, expediting ground unit movement, and observation of indirect fires are all good uses of scout aerial platforms. Observation of restricted/vegetated terrain, locating dismounted threats, rear area reconnaissance, and logistical convoy security may not be the most effective employments of the Kiowa Warrior system.

Face-to-Face. Prior to LD, the air mission commander (AMC) physically checks in at the field trains command post/air TOC for any updated squadron or ACT mission changes such as enemy intelligence, friendly unit locations, and additional squadron graphics. The AWT then lands at the troop TOC, in their assigned zone or sector, for a face-to-face current troop level situation brief. This brief covers in detail any changes to the mission (enemy, weather, or maintenance related) and intelligence updates, and adheres strictly to the air-ground checklist. If good coordination has taken place previously, the AMC may opt for just FM coordination. However, if time did not permit prior integration, this step is crucial. This is an advantageous time to exchange graphics, the troop fire support plan, and concepts of operations. If time permits, face-to-face coordination is always a good idea.

Kiowa Warriors use a computerized internal navigation system that allows them to enter basic graphics on a video display. For ease of entering graphics into the Kiowa Warrior's on-board systems, the squadron staff and troop executive officers should ensure that all graphics and any indirect fire targets are accompanied with a six-digit grid. The squadron SOP should also ensure that all squadron graphic control measures important to air execution are numbered between 31 and 60, such as named area of interest (NAI) 31, 32, 33 and check points (CP) 34, 35, 36. This vastly improves reporting speed and accuracy since the graphics display in the cockpit can coincide with the squadron graphics. This becomes paramount when exchanging graphics at the air-ground face-to-face at any level.

Face-to-face coordination is also critical following squadron-level fragmentary orders (FRAGOs). This could be a FRAGO to either the ACT or GCT or both. Following a FRAGO, the ACT commander normally lands his helicopter near the GCT commander's tank or the troop TOC to quickly cover all the information in the air-ground coordination checklist and to refine their joint scheme of maneuver. The troop fire support officer (FSO) will also assist in developing both FA and mortar targets to support the mission, and should always develop his fires plan with Kiowa Warrior observers in mind. With practice, this can be done in less than 10 minutes with the endstate being a well-integrated troop FRAGO.

Radio Coordination: This step is the most critical and is continuously performed while air and ground elements are working together. It is normal for an AWT to talk with scout section sergeants or dismounted teams; however, for the AWT to drop to a lower net, they must first receive permission from that unit's commander or platoon leader. It is also important that reports are sent up quickly and accurately and that the AWT's location is constantly passed higher and laterally. Reporting procedures for spot reports, situation reports (SITREPs), and clearance of fire must be clearly defined before AWTs drop to a lower radio net.

Michael D. Doubler illustrates an early example of radio air-ground integration in his book *Closing with the Enemy: How GIs fought the War in Europe, 1944-1945:*

"ACC (armored column cover) missions flown during 25-31 July reflect the effectiveness of the new air support techniques and the growing rapport between the combatants, as command-

ers and pilots coordinated their efforts by talking directly with one another. In one case a tank unit commander asked a circling P-47 pilot, 'Is the road safe for us to proceed?' The response 'Stand by and we'll find out' came over the radio as supporting fighter-bombers performed a closer inspection of the road ahead. Spotting a number of German vehicles, the aircraft attacked with bombs and machine guns that disabled the targets. A report of 'All clear. Proceed at will,' from the P-47s let the ground commander know that it was safe to resume his advance."

Below is an example of a modern FM radio coordination where no previous air-ground integration has taken place:

"**Eagle 6:** Saber 6, this Eagle 6 on station in five minutes with one AWT configured seven MPSM rockets and two Hellfire missiles each, call signs Eagle 6 and Eagle 13.

SCO: Eagle 6, Saber 6, roger, contact Avenger 6 his net.

Avenger: Eagle 6, this is Avenger 6; meet me on Avenger Troop command net to receive a SITREP in my zone.

Eagle 6: Roger…Avenger 6, Eagle 6 your net, send SITREP.

Avenger 6: Eagle 6, this is Avenger 6…SITREP follows.

Eagle: Avenger 6, this is Eagle 6, send it, over.

Avenger: Situation: Enemy. Red and Blue have identified and destroyed enemy BRDMs at QV 055626 and QV 036615 at 1530 hours. Red also destroyed a dismounted ADA team at QV 033627 at 1500 hours. We currently have no enemy contact, but expect enemy BMPs vicinity CPs 41 and 42 and possible tanks along PL Hickory at CP 16.

Mission: A Troop conducts zone recon from PL Willow to PL Spruce to identify and destroy enemy recon forces in order to support 1st ID's attack. On order, conduct hasty attacks to destroy enemy platoon-size forces.

Concept of Operation: Avenger Troop conducts a deliberate zone recon from PL Willow to PL Spruce in a troop split vee formation focusing on enemy forces and trafficable attack routes for subsequent tank use. Dismounts will move forward of their Bradleys to gain contact on our own terms with enemy recon forces. Tanks initially follow and support scouts. Upon detection of two or more mutually supporting vehicles or one tank, the troop executes punch drills to destroy enemy vehicles. Mortar fires obscure and suppress enemy recon forces in order to support scouts and tanks crossing danger areas and hasty attacks. The troop is prepared to conduct hasty attacks south into Bulldawgs zone east of PL Oak.

Friendly Situation: Red Team is in the north with Red Alpha at QV 055629, Red Bravo at QV 056626; White is located at QV 045624 providing overwatch for Red; Blue team is in the south with Blue Alpha at QV 055616 and Blue Bravo at QV 054606; Green is located at QV 049619 providing overwatch for Blue. All scout platoons have dismounts on the ground. My mortars are at grid QV 029629 and my FSO is set at QV 046622 overwatching squadron target AH 0074. My trains are stationary at CP 47 and I am moving with Green.

My priority intelligence requirement (PIR) is the location of any tanks and obstacles and my friendly forces intelligence requirement (FFIR) is the destruction of any scout or tank sections.

The coordinated fire line (CFL) is currently PL Oak, on order PL Hickory. My mortars are prepared to support any fire missions you need once cleared by me. They are currently operating on A Troop mortars day 3's freq.

I request your help in clearing the mounted routes in the wooded terrain to the north and south of my troop zone, particularly NAIs 21, 24, and 51 for enemy recon elements. Also request to observe the terrain vicinity CPs 16 and CPs 41 and 42 to confirm or deny enemy platoon-sized formations in that area since the terrain denies me direct observation.

Contact Blue 1 on his platoon internal for further coordination, over.

Eagle 6: Avenger 6, this is Eagle 6; I acknowledge all…break…my current SITREP as follows… I have three AWTs in your zone — each AWT has a complement of .50 cal./rockets and Hellfire/.50 cal. We can support you with 1 hour of day and 5 hours of night vision goggles (NVGs). There is a west wind at 10 gusting to 22 that we'll have to watch as we maneuver and observe to the east and a 25-minute turn around time for one AWT breaking station to forward arming and refueling point (FARP).

Eagle will LD PL Willow at PP 1 with two AWTs abreast, one AWT in the north with Red and White teams and one AWT in the south with Blue and Green teams…providing continuous coverage along your forward line of own troops (FLOT). I will phase the third AWT for refuel. We will occupy OPs in-depth 10, 11, and 15 oriented towards NAIs 21, 22 and CP 16. We will also occupy OPs 17, 18, and 20 oriented toward NAIs 24 and 51 and CPs 42 and 41.

AWTs conducting relief on station will enter from the southern boundary and depart along the northern boundary of either Red or Blue team's zone making radio contact at PP 1 and calling two-way traffic at air control points (ACP) 1, 2, and 3 along Route Raven.

I am the AMC, but you will hear traffic on your net from Eagle 13 AWT and Eagle 25 AWT…nothing follows, over.

Eagle 13: Blue 1, this is Eagle 13, your platoon net, over.

Blue 1: Eagle 13, this is Blue 1…in addition to my Alpha and Bravo sections, I have two three-man dismounted teams vicinity CP 41 and 42 at grids 056617 and the other at 059615. My dismounts at CP 42 have an audio on a possible tracked vehicle on Route Lucy at grid 058610. Request your help in confirming this spot report, over.

Eagle 13: Roger Blue 1, I am moving to the ridgeline just SW of CP 41 to establish observation and develop the situation.

Eagle 13: Blue 1, this is Eagle 13, spot report, over.

Blue 1: This is Blue 1, send it, over.

Eagle 13: One stationary BMP oriented north on Route Lucy at Grid 058612, time 1010 hours local… request mortar fire, over.

Blue 1: This is Blue 1…roger…wait one.

Blue 1: Avenger 6, this is Blue 1, spot report, over.

Continued on Page 50

Air-Ground Integration

Continued from Page 25

Avenger 6: This is Avenger 6, send it, over.

Blue 1: Eagle 13 reports one stationary BMP oriented north on Route Lucy at grid 058612, time 1010 hours…they still have observation and request mortar fire.

Avenger 6: Roger…have them drop to Hammer's net and execute the call for fire, over.

Eagle 13: Eagle 13 monitored…dropping to mortar net."

Net planning for AWTs is critical to success. With two FM radios per aircraft, the AMC or team lead should monitor squadron/task force command and troop/company command. His wingman should monitor troop/company command also, and drop to platoon net on his second radio. This ensures redundancy at the troop/company level, and allows AWTs to operate across the full spectrum. Eavesdropping allows AWTs to assist in situational awareness between troop/company commanders, the squadron/task force commander, and sometimes, between platoon leaders. The remaining UHF and VHF frequencies are used to talk team and troop/company internal.

Conclusion: Like all mission essential task list related tasks, air-ground integration must be constantly assessed and embedded into every training opportunity. Training opportunities are plentiful in cavalry squadrons and regiments, and should include joint terrain board exercises, the "ride and fly program" (where tankers and scouts are given orientation flights and aviators load or gun on an M1 or M3) and, most importantly, troop- and squadron-level officer professional development program (OPD). These OPDs should begin the process and focus on building a common understanding of both air and ground missions, capabilities, limitations, and "how you fight."

In battalion-size task forces, the ability to train air-ground integration is more challenging. However CTC rotations, gunnery densities, or any maneuver opportunity is also an air-ground training opportunity. Seize every possible occasion to train and build your combined arms team. A simple convoy could easily become an integrated air-ground training event with minimal effort or planning.

While no single training event alone builds these lethal and cohesive teams, the combination of events yields a powerful combined arms relationship that capitalizes on mutual understanding and clear mission execution. The end result of effective air-ground integration provides leaders at all levels unparalleled flexibility and the ability to rapidly develop any situation in all environments.

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